ARJUNA JEE 2023

Atomic Structure

DPP-05

1. For which transition in H-atom, the amount of energy released will be maximum?
(1) n = 4 to n = 2
(2) n = 5 to n = 2
(3) n = 2 to n = 1
(4) n = 7 to n = 2

2. If the radius of first orbit of H–atom is x Å, then the radius of the second orbit of Li^{2+} ion will be
(1) x Å (2) $\frac{4x}{3}$ Å
(3) $\frac{9x}{2}$ Å (4) 4x Å

3. Which of the following is not a permissible value of angular momentum of electron in H–atom?
(1) $1.5\frac{h}{\pi}$ (2) $0.5\frac{h}{\pi}$
(3) $1.25\frac{h}{\pi}$ (4) all of these

4. The frequency of radiation emitted when the electron falls from n = 4 to n = 1 in a hydrogen atom will be (Given, ionisation energy of H = 2.18×10^{-18} J $atom^{-1}$ and $h = 6.625 \times 10^{-34}$ Js)
(1) 1.54×10^{15} s^{-1}
(2) 1.03×10^{15} s^{-1}
(3) 3.08×10^{15} s^{-1}
(4) 2.00×10^{15} s^{-1}

5. The ratio of circumference of third and second orbits of He^+ ion is
(1) 3 :2 (2) 2 : 3
(3) 9 : 4 (4) 4 : 9

6. If velocity of an electron in Ist orbit of H atom is V, what will be the velocity of electron in 3rd orbit of Li^{+2}:
(1) V (2) V/3
(3) 3V (4) 9 V

7. What is the ratio of time periods (T_1/T_2) in second orbit of hydrogen atom to third orbit of He^+ ion?
(1) 8/27 (2) 32/27
(3) 27/32 (4) None of these

8. The K.E. of electron in He^+ will be maximum in
(1) third orbit
(2) first orbit
(3) seventh orbit
(4) infinite orbit

9. The ratio of time taken by electron in revolutions round the H-nucleus in the second and third orbits is
(1) 2 : 3 (2) 4 : 8
(3) 8 : 27 (4) 27 : 8

10. An electron revolves round Li^{2+} nucleus at a distance of 1.587 Å. The speed of electron should be
(1) 2.188×10^6 m/s
(2) 6.564×10^6 m/s
(3) 7.293×10^5 m/s
(4) 7.293×10^6 m/s

Answer Key

1. (3)
2. (2)
3. (3)
4. (3)
5. (3)
6. (1)
7. (2)
8. (2)
9. (3)
10. (1)